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M. D.

Inaugural Dissertation.

On.

The morbid effects from drinking cold water

Presented
To the Faculty of the University of Pennsylvania
For the medical degree

By
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of Princeton N.J.
March 5: 1829.

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Remarks on

The morbid effects produced by drinking cold water during a high atmospheric temperature while the body is in a state of exhaustion from previous fatigue.

The disease arising from drinking cold-water during a high thermometrical temperature; though it may be classed among the most painful, during its brief continuance, to which human nature is liable; still appears to have attracted a smaller share of attention than its importance from its rapid and, in many instances, fatal termination and, I had almost added, its frequency would seem to demand. —— This disease is far more frequent than is generally supposed & its frequency and mortality will always be found to bear a pretty ~~pretty~~ direct ratio to the heat of ~~the~~ the weather. To show that this affection is not rare or uncommon it will only be necessary to adduce the number of deaths that are reported as having happened from this cause during a given time in some of our cities remembering at the same time that it is a list of the deaths only & not of the whole number of cases of the disease which occurred in those places. In Phil.a during the week commencing the 17th & ending the 23d of July 1825 – while the thermometer ranged between 89° & 94° – 14 deaths from drinking cold water are reported. – In N. York also during the 9 days succeeding the 10th of July 69 cases of sudden death are reported most of which were thought

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to have been caused by drinking cold water. If to arrive at some conclusion relative to the whole number of those affected by this disease we add to the list of deaths known to have been thus caused a portion of those reported "Sudden" "cause unknown" &c and then consider the proportion of recoveries as about triple that of the deaths we shall from such an estimate be forced to allow that instances of the disease are by no means rare during those periods favourable to their occurrence. — In this opinion we shall be further confirmed by the declaration of one of the Boston physicians that 54 cases of this disease happened in his practice during one week. Nor is it to be inferred that the disease in question is confined to cities alone: it prevails throughout the country in an equal if not greater degree in proportion to the relative number of inhabitants & there is no physician who does not can perceive year witness more than one case of this kind. From this consideration of its not unfrequent occurrence it is difficult to conceive a reason why it has not oftener been the subject of discussion unless it may be from the short period of the year during which it can happen & the worthlessness of the larger portion of those who suffer from its effects. —

In entering upon the consideration of this subject we are met upon the very threshold by the hard contested question relative to the stimulant or sedative nature of the action of Cold upon the human system. — To wield this subject in such a manner as to arrive at conclusions which should prove alike unobjectionable & satisfactory to the minds of all would require the talents of an intellectual

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Hercules. Whether a master spirit shall ever arise to grasp the question in all its bearings, to dissipate the obscurity & unravel the intricacies in which the debatants have enveloped it and to unite all in the same opinion remains for time to determine. Each party will perhaps long continue to entertain the opinion it has embraced and consider itself as fitted out by the facts & reasoning which can be adduced in support of that opinion. Not considering any analysis of the much that has been written on the stimulant or sedative properties of cold as calculated in any way to elucidate the disease now to be discussed it will be passed over in silence. Yet in passing it may not be amiss to notice one argument which has been adduced in favour of the sedative nature of cold. — The heat of the body generated by respiration can scarcely be regarded as accurately fixed beyond all variation for though 98° is generally acknowledged as the standard of heat as regards man yet a difference of some few degrees is to be allowed for the difference of age temperament & even sex as recently noticed by Edwards & Gentil.
But if some variation in the degree of vital heat is found to exists in different individuals of the same species how much wider is the difference between the many different species embraced by the Zoological catalogue: yet some degree of heat is alike necessary to all – Calorie or heat, to use the Verbs synonymously, – is on all hands acknowledged as a stimulant. That then may be regarded as the grand stimulus of life which when reduced

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below its normal degree will give rise to disease and a total abstraction of which produces certain death. Now it has been said that as cold consists in nothing but the absence or diminution of heat it cannot but be sedative and this reasoning appears very clear. But to this on the other hand it is answered that if this reasoning be correct then "the act of departure or passing out of the heat" must be stimulant since all parts contract as they become cold & contraction can only be effected by stimuli. Yet it may be questioned whether contraction does take place from cold acting upon the irritability of the muscular fibre but whether it is not rather a mere collapse of the part from the diminution of its circulation. At all events the argument in favour of cold as sedative would appear too conclusive to be thus readily set aside.

This disease so frequent in the U. States is scarcely ever heard of from warm climates in other parts of the world yet cases do occasionally occur abroad though it is said that these cases are never so severe as similar cases with us. To accounts for this difference of frequency it has been suggested by Dr Pascalis that we should have recourse to the precept of Hippocrates to study well the nature of our soil & of our waters. It would appear from what follows this remark that he only intended it to apply to the city of N. York. – Yet since morbid effects from drinking cold-water are not more common in that city than in other parts of our country where great diversity of soils would be found to exists and since a solution which should apply to one part should equally apply to the whole it will readily be seen that

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this has taken place a train of other symptoms [illegible] presented. The blood [illegible], the [illegible] becomes [illegible] in the [illegible] thus taken the surface of a deathlike paleness; [illegible] [illegible] muscular [illegible] or irritability [illegible] the patient is [illegible] from [illegible] from the spot where he [illegible] [illegible], a cold sweat stands upon the forehead, the pupils dilate and the retina becomes in some degree insensible to light, [illegible] involuntary discharges take place from loss of power in the sphincters & [illegible] the [illegible] from a few [illegible] [illegible] as the [illegible] or at the [illegible] [illegible] of its vital Principle.

In the second form or variety of the disease the conservatory powers of the system recovering from the effects of the first shock soon rally, reaction & increased irritability ensues. [illegible] water [illegible] [illegible] of the stomach & [illegible] at occasional intervals [illegible]. Respiration is [illegible] the expression of the [illegible] is [illegible] to pleurisy. [illegible]

[illegible] of all the
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the [illegible] injected & the [illegible] [illegible]

severity and [illegible] beginning [illegible]

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[illegible] exhaustion

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the affected muscles which are thereby excited [illegible] [illegible] contractions. and in these cases the [illegible] irritability of the muscular [illegible] of the bowels being preternaturally increased are excited into contractions [illegible] [illegible] a tetanus of the stomach which state is [illegible] [illegible] [illegible] [illegible] in the abdominal muscles, [illegible] of the [illegible], & the [illegible] [illegible] [illegible] the muscles [illegible] [illegible] usually are thrown into action. ——. This state of things, mutatis mutandis is not altogether [illegible] to the [illegible] mentioned by Dr Rush (Med. Obs. et Enq. vol. 1 p. 190) as occurring in the W. Indies & called by the French physicians "Crampe seche" or cramp of the bowels [illegible] [illegible] [illegible] action of the cold [illegible] [illegible] of the extreme [illegible]. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]. —— Dr. B[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the following [illegible] case. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] his [illegible] the adults [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] affected with [illegible], [illegible] [illegible], [illegible] — Here then would seem to be [illegible] [illegible] [illegible] of the [illegible] of the [illegible] to which the stomach is affected in the [illegible] [illegible], [illegible]; [illegible] [illegible] [illegible] cold water. The cold water produces at first a [illegible]

[illegible] action in the [illegible] contraction of that which its nerves 14
[illegible] [illegible] irritability is [illegible] [illegible] the inflammation [illegible]
[illegible] developed which inflammation is only [illegible] [illegible] [illegible]
[illegible] in the **tetanus which** follows.

Autopsic Examination. In those cases of sudden death which take place in the first form of the disease though the larynx [illegible] engorged & the submucous [illegible] in some cases [illegible] still the mucous itself [illegible] no traces of inflammation.

In the second form of the disease, when death has taken place [illegible] the violence of the convulsive efforts a different state of things is found to exist. The effects are more generally found [illegible] the nervous centres [illegible] [illegible] [illegible] [illegible] in [illegible] & [illegible] [illegible]. In [illegible] [illegible] the vessels in the membranes, the surface of the [illegible] are deeply congested & the ventricles are often found completely filled with serum. [illegible] [illegible] [illegible] [illegible] from the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible] which have been presented of the action [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] exist. But in [illegible] [illegible] [illegible] [illegible] cases of death from the second [illegible] [illegible] [illegible] [illegible] of inflammation [illegible] [illegible] which [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] that inflammation

[illegible]

[illegible]

[illegible]

[illegible]struction & means of assimilation [illegible] [illegible] [illegible] [illegible]

[illegible] [illegible] [illegible] [illegible]. —

The Treatment must be different in the divisions of the disease. The First Stage, as previously described, is when the system is depressed to such an extent as to show no signs of reaction. In the worst cases of this kind death is so immediate as to leave little time for the employment of remedies. In [illegible] cases of [illegible] [illegible] Dr. Rush [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] "[illegible] drowning", and means [illegible]. — [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]. — — — The principle [illegible] [illegible] [illegible] the system from its state of prostration & [illegible] [illegible] [illegible] powers & bring about Reaction; it is only by [illegible] [illegible] [illegible] [illegible] to prevent [illegible] [illegible]. — Of all the methods [illegible] [illegible] which [illegible] [illegible] [illegible] [illegible] the warm bath, [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] advantage. It [illegible] the circulation from the [illegible] [illegible] to the capillaries, with

[illegible] previously [illegible] [illegible]

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[illegible] be [illegible] [illegible]

[illegible]

[illegible] the [illegible] [illegible] [illegible]

[illegible] [illegible]. The [illegible] can [illegible] generally be removed or

[illegible] but [illegible] [illegible] [illegible] the [illegible]

[illegible]

[illegible] inexpedient [illegible]

[illegible] or [illegible] or [illegible]

[illegible] can, he had but [illegible]

[illegible], it has been advised [illegible]

[illegible] [illegible] the [illegible]

[illegible] full of water [illegible]

[illegible] either [illegible] or [illegible]

[illegible] every 4 or 5 minutes. If called immediately [illegible]

[illegible] not be [illegible] as a first step to evacuate the stomach by means of the stomach pump. If the [illegible] the stomach is [illegible]

[illegible] it [illegible] be [illegible]

[illegible] professor Rush

[illegible] eaten [illegible] in degrees. [illegible] established

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[illegible]

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[illegible] by Dr [illegible] who advises Laudanum as "the only certain [illegible]". It is directed to be given in large [illegible] [illegible] [illegible] [illegible] to [illegible] to the [illegible] of the [illegible]. — But [illegible] with a proper degree of judgment [illegible] [illegible] [illegible] [illegible] in these cases is [illegible] by all but the [illegible] [illegible] [illegible] [illegible] [illegible] is [illegible]. [illegible] [illegible] in the [illegible] part and [illegible] [illegible] Dr Rush but perhaps [illegible] [illegible] [illegible] of the [illegible]. — Laudanum is [illegible] by [illegible] the [illegible] and [illegible] [illegible] the [illegible] [illegible] of the [illegible] [illegible] in large doses it [illegible] the [illegible] circulation has a tendency to increase the [illegible] state of the [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible] is [illegible] [illegible]. From [illegible] Dr [illegible] [illegible] of [illegible] [illegible] of Laudanum in large doses [illegible] [illegible] Dr Watts [illegible] thinks [illegible] [illegible] [illegible] — — [illegible] it [illegible] [illegible] advisable. [illegible] the quantity [illegible] [illegible]. And this is the more proper

since Tetanus from this cause is not so obstinate as from other 21.
causes and therefore will neither require nor sanction such full & repeated doses as would be proper in Tetanus from wound). But there may be some choice as to the article of this class which may be used with or substituted for the Laudanum. Such of these I would venture; from the results of a case in which fell under my observation; to suggest the opts of Turpentine as peculiarly worthy of attention. The case was one of considerable severity but was happily relieved by the use of the warm bath, a mustard plaster to the region of the stomach & the internal use of the Turpentine. It was given quite warm in doses of two tea spoonfull repeated in 10 minutes till two doses had been taken & then the dose was diminished one half: each dose was followed by an equal quantity of Ether. — Sinapisms over the stomach are also found beneficial in relieving the pain & spasm of that organ. Blisters has been used but should a more active and speedy revulsatory be deemed requisite it will be found in the Nitric acid, diluted two parts of the acid to one of water spread over the region of the stomach with a feather & its application continued till smart pain is felt when it is to be neutralized with the Carb. of potash. By the continued & judicious use of such means we may generally expect to quiet the irritation of the stomach & calm the violence of those

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symptoms to which it has given rise. But we are not now as it was frequently the case to consider all further attention unnecessary. Nothing is more common than for such cases to be followed by a fever of greater or less severity often with great determination of blood to the head. To prevent this it is always better to direct a purgative to open the bowels freely. For this purpose Calomel is to be preferred more particularly on account of its effects upon the hepatic system which is often, as was observed by Dr Rush, rendered liable to inflammation or obstructions after an attack of this kind & if the fever has come on V.S. is again to be resorted to graduating the quantity to be taken according to the violence of the febrile symptoms. To protect the brain when a preternatural determination to it exists cups & leeches followed by cold applications to the head & sinapisms to the feet will be proper. If this determination has been produced or aggravated by the previous free use of laudanum an emetic may be given. A combination of Tart. Ant. & Ipecac. has this advantage over any other that while it is certain in its operation the Ipecac. is known to possess the faculty of lessening the narcotic powers of opium & thus appearing to strike somewhat of the character of an antidote. Having thus brought the case to a close all that remains for us is to direct a restricted diet for some days when the patient may return to his ordinary mode of life. Chronic Hepatitis & ulcers of the stomach may follow: the first requires no peculiarity of treatment and for the latter little else than a palliative course can be pursued. – Finis –

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March 1828

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